

Davis Island Dam & Lock Number 1
(Davis Island Lock and Dam)
Ohio River, mile 4.7 on right bank
Pittsburgh vicinity
Allegheny County
Pennsylvania

HAER No. PA-65

HAER
PA
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D. C. 20240

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HISTORIC AMERICAN ENGINEERING RECORD

Documentation of Lock No. 1 - Davis Island Dam,
Ohio River, Allegheny County, Pennsylvania

Compiled in accordance with a Memorandum of Agreement
between the Advisory Council on Historic Preservation,
the Pennsylvania State Historic Preservation Office and
the Pittsburgh District of the U.S. Army Corps of Engineers,
December 23, 1982.

Prepared by:

Pittsburgh District
U.S. Army Corps of Engineers
Pittsburgh, Pennsylvania

1983

HISTORIC AMERICAN ENGINEERING RECORD

Lock No. 1 - Davis Island Dam
(commonly known as Davis Island Lock and Dam)

Location: Ohio River, mile 4.7 on the right bank, Allegheny County,
Pennsylvania, near Avalon and Bellevue

Present Owner: CONRAIL - site of old lock on right bank of Ohio River;
Commonwealth of Pennsylvania - all river bottom below Ordinary
High Water

Present Use: None

Significance:

As the first lock and dam on the Ohio River, the Davis Island Lock and Dam was an experimental project testing the skills of the 19th century engineers. Project design achievements included the first rolling lock gates, the largest movable dam built in the 19th century, and the widest chamber of world history. Project construction engineering gained increased efficiency through conversion from manpower to steampower. Especially notable was the study of national and international engineering technology performed during planning and construction phases. The civil engineers associated with the project included several of the founders of the Engineers' Society of Western Pennsylvania; military engineers supervising the project included Frederick A. Mahan, international waterways engineering expert; William E. Merrill, the "Father of the Ohio River Project"; George W. Goethals of Panama Canal fame; and William M. Black and Lansing H. Beach, who later served as Chief of Engineers, US Army.

In addition to the stimulus for the waterborne commerce industry, it had major benefits for the industrial and commercial development of the Port of Pittsburgh, providing increased and reliable water supply and alleviating the effects of water quality deterioration. The harbor which the project provided allowed interchange of raw materials and manufactured products by water within the Port of Pittsburgh and furnished improved marketing facilities for coal from the Monongahela River basin and steel from the Pittsburgh area.

The engineering experiment at the Davis Island project proved so successful that the system was extended the entire length of the Ohio River, with completion of 50 locks and dams similar to the Davis Island project by 1929, permitting export of the raw materials and manufactured products of Pittsburgh and Western Pennsylvania via the inland rivers to western and southern markets and to work markets via an all water route. The reliable depths for navigation provided by Davis Island project permitted development and utilization of such marine engineering achievements as the diesel towboat and standard welded steel barge.

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PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date of Erection: Work was begun on August 18, 1878 and the lock was formally opened on October 7, 1885.
2. Architect/Contractor: Pittsburgh District, US Army Corps of Engineers, under Lieutenant Colonel W. E. Merrill, District Engineer, with Captain F. A. Mahan, Corps of Engineers in local charge.
3. Original Plans and Alterations: Many original drawings and blueprints associated with surveys, real estate acquisition, construction design, subsequent alterations, and a proposed dry dock facility which was never constructed are on file at the Pittsburgh District of the Army Corps of Engineers and the National Archives. An inventory of the documents on file at either location is included with this report.

- B. Historical Context: Davis Island Lock and Dam was the first navigation structure on the Ohio River and the first movable dam built in the United States. Similar structures on the lower Monongahela and Allegheny Rivers and further downriver on the Ohio River were constructed in quick succession. Construction of Emsworth Locks and Dams at mile 6.2 of the Ohio River in 1921 allowed for the elimination of Davis Island Lock and Dam. Plans to develop the old lock chamber and adjacent land into a dry dock and maintenance facility were developed but later abandoned, and the property was sold to the Pittsburgh, Fort Wayne and Chicago Railway Company (now CONRAIL) on 11 December 1923.

PART II. ARCHITECTURAL INFORMATION

The following information is taken from "World's Columbian Exposition, Chicago, Illinois, 1893. War Department Exhibit" pp. 42-46, from National Archives, Record Group 77, File No. P449-49.

A. General Description.

"The Chanoine dam at Davis Island, which was formally opened October 7, 1885, is the first of a series of movable dams devised for the radical improvement of the Ohio River. It is located 5 1/2 miles below Pittsburgh, and is designed to make slackwater between the dam and Lock No. 1, on the Monongahela River, and on the Allegheny River to Thirty-sixth street, 2 1/2 miles above its mouth.

The lock is located on the north side of the Ohio. The distance between the gates of the lock is 600 feet, and the total width of the lock is 110 feet. The noteworthy difference between this and ordinary locks is in the employment

of rolling instead of swinging gates, and in the construction of recesses for the reception of the gates when open. These recesses or slips are built toward the shore, from the lock, a distance of 120 feet. The total length of the river lock wall is 689 feet. The wall is 11 feet thick, and has a height of 17 feet above and 2 1/2 feet below the gate sills, making a total height of 19 1/2 feet. The land wall (including the development of the recesses for the gates) is 1,169 feet long.

The movable dam begins at the river lock wall at a point 100 feet above the lower lock gate, and extends to the abutment on Davis Island. The dam is divided into four sections, viz: (1) The navigable pass, which is composed of 139 wickets, 4 feet 1/4 inches between centers, and 40 wickets 4 feet between centers, making a total width of pass of 719 feet. (2) The bear-trap chute, 52 feet wide, which is composed of two timber gates hinged to the foundation and operated by the water pressure being admitted and released from beneath the gates. The object of this chute was to relieve the Chanoine dam from the large quantities of driftwood which is prevalent in the Ohio River. (3) Weir No. 1, 212 feet wide, which has 53 wickets; and (4) Weir No. 2, 216 feet wide, which has 54 wickets. The distance between the centers of wickets on the weirs is 4 feet. The main sill of the weirs have the following references: Weir No. 1 is 2 feet and Weir No. 2 is 3 feet above the sill of the navigable pass. This stepping of the sills was necessary in order to make the profile of the dam conform to the natural bed of the river. The perpendicular height of the navigable pass, from the sill to the crest of the dam, is 12 feet 1 1/2 inches, while the height of the weirs are respectively 2 and 3 feet less, corresponding to the stepping of the sills referred to. The crest line of the navigable pass and weirs, which is a right angle to the river lock wall, is a continuous line (broken only by the bear-trap chute) and extending to the abutment on Davis Island, a total distance of 1,223 feet.

Seven years and nineteen days were consumed in the construction of the dam. Work was begun on August 18, 1878, and completed October 7, 1885, when the dam was formally opened with a grand public demonstration combining civic and marine displays. The cost of construction was \$810,000."

B. Foundations.

"In selecting foundations for the land and recess walls, the gates, the Chanoine dam at the head of the lock, and the river wall, borings were made to determine the depth of the rock. The land and recess walls are built on an argillaceous rock, which was excavated to the lower course of masonry; at a point 50 feet outside the wall, the rock disappeared below the lowest point of the foundation. On the site of the river wall and dam proper no rock could be found at a depth of 15.17 feet in the former and 13.58 feet in the latter, below the gate sill. Instead of the rock a compact gravel was found. As these depths were deemed to be below any possible scour, it was decided to build on the gravel. The foundation for the river wall and dam proper was begun at the reference below the gate sill already given. This foundation (composed of concrete) was carried up, for the river wall, to a reference of

2.50 feet below the gate sill, making a depth of concrete of 12.67 feet, while the foundation for the dam was carried up to a reference of 1.58 below the sill of the dam, making a depth of concrete 12 feet. In the foundation of the gate and of the Chanoine dam at the head of the lock, the bottom of the concrete was carried level at the reference of 15.17 feet below the gate sill, until it intercepted the rock at a point 50 feet outside the land wall. From thence to the land wall the depth decreased with the rising inclination of the rock, terminating at the land wall at a depth of 2.75 feet below the gate sill. From this depth to the full height it was finished with the timber gate sills and stone masonry.

The track sills on which the gate travels across the lock are built in the solid masonry, and are anchored deep in the concrete (or solid rock as the case may be) by bolts 1 1/2 inches in diameter, placed at intervals of 4 feet and 3/4 inches. The lower ends of the bolts are provided with discs 18 inches square, which prevent the bolts being pulled through the concrete. As the rock (which has a rising inclination) is intercepted each successive bolt becomes shorter. To secure anchorage equal to those placed at full depth of the concrete, the points of the shorter bolts were split, and secured by a fox wedge in a hole drilled in the solid rock. The shorter bolts are also provided with discs similar to those placed on the bolts having the full depth of concrete, in addition to the fox wedge.

Two large white oak timbers, placed 11 feet 6 inches apart and held in place by the bolts referred to, form the gate track sills. The upper sill is 18 inches square; the lower 23 by 25 inches. In top of these sills a rabbet is cut, in which the track iron, 1 inch thick and 6 inches wide, is laid. The lower edge of the upper and the upper edge of the lower is protected by angle irons, preventing abrasion by the washing of gravel, sand, etc. caused by the wheels of steamers.

The floor of the gate foundation between the tracks (across the lock), which is 14 inches below the rail, forms a depression in which it was feared gravel and sand would accumulate in quantities which would interfere with the passage of the gate. Inspection of this after a winter's rest of the gate, during which time masses of ice passed over the sills, showed that the material collected did not interfere in the slightest degree with the operation of the gates. Furthermore, it was found that as soon as the lock was put in operation, the strong current which rushed between the tracks on its way to the lock filling and discharging valves located in the lower walls of the recesses, freed the cavity of all the material deposited there. The foundation of the lower walls of the recesses are deeper than those of the upper, while the gate tracks are on the same level. This depression of the lower so much below the upper wall, with the sloped pavement between them, is made to give a waterway to the lock filling and discharging valves which are in this wall."

"The portion of the foundation of the dam at the head of the lock and of the gates, that of the dam proper extending from the river wall to Davis Island, and the river lock wall, in all of which rock could not be reached at a

reasonable depth, were built upon a concrete foundation, resting upon a hard gravel. The foundation of the dam at the head of the lock and of the gates follows the rock until a reference of 15.17 feet below the sill is reached. This level is preserved throughout."

C. The Dam.

"The floor of the dam is a framed structure composed principally of 12 inch by 12 inch white oak timbers, framed in such a manner as to form a rigid combination. This framework was built in the foundation at the proper height, and the concrete built up around the timbers, thoroughly embedding them. The anchor bolts secured in the concrete foundation near the bottom pass up through the timbers, securing the framed structure to the foundation. The upper bolt is designed to resist any strain imposed upon the service bridge, either from actual work or in case of the bridge becoming clogged by driftwood. The lower bolt, of which there is one to each wicket, holds the dam in place. On the foundation thus prepared and composed of the concrete anchorage and framed structure referred to, the dam is secured. The wicket anchor bolts pass up through the timber structure and through a cast-iron box called the "horse box". This box forms the fastening for the lower axis of the horse, and is the chief connection holding the dam in position. Each wicket is composed of a horse, prop, and a panel or shutter. The lower axis of the horse is secured to the horse box, the upper axis is attached to the panel near the center, around which the panel is free to rotate. The wicket when in position stands at an angle of 20° with the vertical top, inclined downstream, the lower end or breach resting against the main sill, while the upper end is supported at the upper axis of the horse by the prop, which rests against a castiron socket secured to the foundation, called a "hurter". Thus the dam is formed by a series of wickets extending across the river. Each wicket is 3 feet 9 inches wide with a space of 3 inches between adjacent wickets. This space is to prevent the wickets becoming fouled with each other, which would prevent their free movement. These spaces during very low stages of the river can be closed if necessary, thus saving the water to maintain the pool at its full height.

The arrangement by which each wicket is held in position and lowered to the bed of the river at will may be described as sort of folding frame; all parts when lowered assume a horizontal position and lie below the main sill, insuring safety from steamboats or floating objects coming in contact therewith. The dam is operated by means of a service bridge and a maneuvering boat. The wickets of the weirs are maneuvered from the service bridge, those of the navigable pass from the boat. The service bridge is composed of a series of light trestles 8 feet apart with floors hinged to them and located immediately above the dam, extending on weirs 1 and 2 from the bear-trap chute to Davis Island, a distance of 428 feet. These trestles are so arranged that when not in use they lie in a recess or chamber in the foundation prepared for them. The floors hinged to them, forming connecting links between the trestles when in position, fold on top of the trestles when lying down. When the trestles are drawn up with the floors connected they form the framework of a bridge, extending from the bear-trap chute across the river parallel with

the dam to Davis Island. When the service bridge and wickets of the dam are all down and it becomes necessary to raise the dam the first step is to draw up the trestle nearest the shore. This is done by means of a chain attached to it. The power employed is a trestle winch which runs on a track formed by the connecting floors of the trestle. When the first trestle is drawn up and its floor fastened it forms the first section of the bridge; the winch is then advanced on to this section, and the second trestle is drawn up, and its floor fastened. This operation is repeated until all the bridge is raised. The service bridge being raised, everything is in readiness to raise the dam. The operation of raising the dam is accomplished by another winch, called the wicket winch, the axis of which is parallel to the dam. To the breach of each wicket is attached a chain which is connected with the trestle and has been brought up with it from its recess in the foundation. This chain is used to draw the wicket from its position when down to its position when raised. When the wicket is lying down all the parts assume a horizontal position; when the power is applied to the winch the wicket rises feathering to the current until it is drawn to its position, when the prop drops into the socket of the hurter, which makes a ringing sound. This is a signal for the workmen at the winch to stop; the chain is slacked up, and the prop rests firmly in its seat. The wicket, which so far has assumed a horizontal position, now requires to have the breach lowered to its bearing against the main sill in the foundation. When this is done the first 4 feet of the dam is completed, and the operation is repeated until all the wickets are raised. As before stated, only the weirs are maneuvered from the service bridge, the navigable pass being worked by a maneuvering boat. This boat, which is built of timber, is 50 feet long, 16 feet wide, and 3 feet deep, and is equipped with a steam engine and boiler used for raising the wickets, instead of a winch as on the service bridge, the engine being more rapid in its operations. The mode of raising the wickets by the boat is as follows: The boat is anchored to the river-lock wall, and from this position the first thirteen wickets are raised. This number of wickets gives a length of dam equal to the length of the boat, which is then placed broadside to the dam. The last wicket raised supports the boat for the next wicket. With the raising of each wicket the boat is advanced one, and so continued until all are raised. The engine is located in the center of the boat; the chain from the engine by which the wickets are raised changes its direction by passing over a sheave mounted at the bow of the boat, the end of which is attached to a hook, technically called a "maneuvering hook", by means of which the wickets lying in the bed of the river are caught and raised to their upright position.

To lower the dam the maneuvering boat is placed against the dam as in raising, except the position of the boat is reversed end for end, the top of the wicket is drawn forward about 9 inches, until the prop which supports the wicket drops off the second step of the hurter, when the wicket is released and the pressure of water against the wicket forces the prop into the downward channel of the hurter, and the wicket falls gently and without any shock into its position on the foundation in the bed of the river. In lowering the dam after all the wickets are down the service bridge is also lowered, thus giving an unobstructed channel."

D. Lock Gates.

"Steam power is employed to operate the lock gates. A portable engine and boiler is situated, one at each gate, the power of which is transmitted through a spiral drum on which is operated two chains, one attached to each end of the gate. By the reversible motion of the drum the gate is either opened or closed."

E. Hydraulic Machinery.

"The lock filling and discharging valves are operated by water pressure operating hydraulic jacks, supplied from water tanks elevated to a minimum height of 44 1/2 and a maximum of 60 feet. The water tanks are supplied by a pump in the river lock wall, which is operated by a 25-inch turbine wheel driven by the head of water created by the dam."

PART III. SOURCES OF INFORMATION

A. Original Drawings, Blueprints and Photographs:

Pittsburgh District
US Army Corps of Engineers
William S. Moorhead Federal Building
Pittsburgh, PA 15222

Navy and Old Army Branch
Military Archives Division
National Archives
Washington, DC 20408

Appendix I to this report contains an inventory by source of archival materials related to Davis Island Lock and Dam. The records of the National Archives are organized according to the file folders in which they are stored. File numbers or drawing numbers, when present, are shown in parentheses. For a general overview of the major features of the lock and dam as originally constructed, the reader is referred to Plates 1-19, National Archives, Record Group 77, File Nos. P449-1 through P449-19. Copies of these Plates may be obtained, for a fee, from the National Archives. The lock features as they existed shortly after the completion of Emsworth Locks and Dams, which replaced Davis Island Lock and Dam is on "OHIO RIVER, DAVIS ISLAND DAM, BELLEVUE, PA, Scale 1" = 50', Sept. 19, 1921", File No. 0-5-18, in the Pittsburgh District files.

B. Construction Records and Correspondence:

Annual Report of the Chief of Engineers, National Archives, for years 1878-1886 provides considerable construction information.

Entry 1281, Record Group 77, National Archives, Philadelphia Federal Records Center has Colonel Merrill's correspondence and records.

PART IV. PROJECT INFORMATION

The Pittsburgh District of the Corps of Engineers plans to remove the submerged land wall, guide walls, and esplanade of Davis Island Lock and Dam early in 1983. Being submerged at a shallow depth near the shoreline, these features are a hazard to river navigation and may be removed by the Corps under their authority contained in Sections 15, 19, and 20 of the River and Harbor Act of 1899. Other features of the lock and dam such as the wickets and river wall were removed after Davis Island Lock and Dam was replaced by Emsworth Locks and Dams in 1921.

C. Published Sources:

Johnson, Dr. Leland R., THE HEADWATERS DISTRICT. A History of the Pittsburgh District, U.S. Army Corps of Engineers. Published by the Pittsburgh District, 1978. This book contains a bibliography with many references on Davis Island Lock and Dam.

Accounts of the opening of Davis Island Lock and Dam on October 7, 1885 are found in:

Pittsburgh Commercial Gazette, Wed. Oct. 7, 1885 pp. 1 & 3 and
Thurs. Oct. 8, 1885 pp. 1 & 2

The Evening Penny Press, Pittsburgh, Wed. Oct. 7, 1885, Vol. 2,
No. 238

Harper's Weekly, Vol. XXIX, No. 1504, Sat. Oct. 17, 1885, Harper and
Brothers, New York.

These are available on microfilm at the Carnegie Library, Pittsburgh, PA.

Prepared by: Conrad E. Weiser
Biologist
Pittsburgh District
US Army Corps of Engineers
November 1982

National Archives, Still Pictures Branch Record Group 77

Photographs:

"Celebration at Opening of Davis Island Dam", October 7, 1885
- a view of the steamboats and crowds at the lock (77-H-62)

six views of the Davis Island back channel dam during and
after construction, ca. 1885 (77 HP 449 1-6)

National Archives RG77 File P449 1-19

OHIO RIVER DAVIS ISLAND DAM

Plate No. 1.	(general overview)	1889 (P449-1)
Plate No. 2.	PLAN	1889 (P449-2)
Plate No. 3.	PLAN OF LOCK	1889 (P449-3)
Plate No. 4.	LOCK GATE	1889 (P449-4)
Plate No. 5.	(lock machinery)	1889 (P449-5)
Plate No. 6.	OPERATING MACHINERY OF VALVES IN LOCK WALLS	1889 (P449-6)
Plate No. 7.	OPERATING MACHINERY OF VALVES IN LOCK WALLS	1889 (P449-7)
Plate No. 8.	QUADRUPLE COCK AT UPPER GATE RECESS	1889 (P449-8)
Plate No. 9.	ENGINES FOR OPERATING LOWER LOCK GATE	1889 (P449-9)
Plate No. 10.	HYDRAULIC JACK FOR LOCK GATE	1889 (P449-10)
Plate No. 11.	Auxiliary Gate to close Recess Valve to close opening between tracks.. Details of iron work.	1889 (P449-11)
Plate No. 12.	WEIR No. 1	1889 (P449-12)
Plate No. 13.	WICKETS	1889 (P449-13)
Plate No. 14.	DETAILS OF NAVIGABLE PASS	1889 (P449-14)
Plate No. 15.	WINCH FOR RAISING TRESTLES	1889 (P449-15)
Plate No. 16.	WINCH FOR RAISING WICKETS	1889 (P449-16)
Plate No. 17.	WINCH FOR RAISING WICKETS	1889 (P449-17)
Plate No. 18.	DRIFT TRAP WITH BEAR TRAP GATES	1889 (P449-18)

above Plates are line drawings on light drafting cardboard

Plate No. 19.	RENEWAL OF GUIDE WALLS OF LOCK, (blueprint)	April 12, 1900 (P449-19)
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DOCUMENTS RELATING TO LOCK NO. 1 - DAVIS
ISLAND DAM, OHIO RIVER, ALLEGHENY CO., PA

Contained in:

Record Group 77
Cartographic and Architectural Branch
National Archives
Washington, DC 20408

Compiled by:

Conrad Weiser
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William S. Moorhead Federal Bldg.
Pittsburgh, PA 15222

November 1982

APPENDIX A

Archival Materials: Lock No. 1 - Davis Island Dam,
Ohio River, Allegheny County, Pennsylvania

National Archives RG77 File P449 20-39

blueprints

OHIO RIVER, DAVIS ISLAND DAM

Upper Guide Wall, Open Drain and

Drift Chute, Dec 17, 1900

(P449-20)

Lower Guide Wall and Drift Chute, Aug 6. 1900

(P449-21)

OHIO RIVER, Rebuilding of Back Channel Dam at Davis Island, 4 sheets

General Plan and Location May 13, 1903

(P449-22)

Piers and Abutments May 15, 1903

(P449-23)

Details of Iron Work May 21, 1903

(P449-24)

Details of Iron Work May 1903

(P449-25)

Outline Plan and General Sections of Movable Dam at Davis Island,

Ohio River, as actually constructed

(P449-32)

OHIO RIVER, Plan and Elevation of Chanoine Dam for Navigable

Pass at Davis Island. 3/4 inch scale, 1st April, 1881,

Kinsey. 0-2-12

(P449-33)

OHIO RIVER, Details of Wickets and Iron Work for Navigable

Pass, 1 1/2" and 3" scale 1st October 1881, Kinsey.

(P449-34)

OHIO RIVER, Details of Cast Iron Work for Weir No. 2,

Scale 4" & 6" = 1 Foot, 4th Jan 1882, Kinsey.

(P449-35)

OHIO RIVER, Details of Trestles for Weir No. 2, 2" &

4" = 1 Foot 1st Apr 1882, Kinsey.

(P449-36)

OHIO RIVER, Details of Trestle Floors for Weirs 1,

2 & 3, 4" 6" & 9" = 1 Foot, 18th March 1882. Kinsey.

Corrected May 10th 1883

(P449-37)

OHIO RIVER, General Plan of Leaves and Details of

Bear Trap for D.I.L. & D. 1/2, 1 1/2 & 3 in: Scales,

Nov. 19th 1888

(P449-38)

OHIO RIVER, ELEVATION OF BEAR TRAP AT D.I.L.&D. 3/4"

Scale, Nov. 14, 1888, Kinsey.

(P449-39)

National Archives RG77 File P449 40-54

blueprints

OHIO RIVER, PIER NO. 1 at D.I.L.&D. Scale 3/8" = 1 Foot,
Sep 24, 1888. Kinsey. (P449-40)

OHIO RIVER, DAVIS ISLAND DAM, Design for Steel Lock Gates,
March 10th 1896 (P449-42)

OHIO RIVER, DAVIS ISLAND DAM, Steel Rails for Gate Tracks,
Scale 3/4" = 1', Sheet No. 3 of 4, May 5th 1896 (P449-43)

OHIO RIVER, DAVIS ISLAND DAM, Design for Lateral Movement
Mechanism of Lock Gates in lieu of Friction Rollers as
per original Drawings dated March 10th and 30th 96.
Scale 3/4" = 1 ft. Sheet 4 of 4 April 28th 96. (P449-44)

OHIO RIVER, DAVIS ISLAND DAM, General Plan of Bear Trap
Dam, 25 April 1905 (P449-45)

OHIO RIVER, DAVIS ISLAND DAM, Details of Iron Work for
Bear Trap Dam and Two Piers, May 29th 1905 (P449-46)
(ditto) April 29th 1905 (P449-47)

OHIO RIVER, DAVIS ISLAND DAM, Details of Bear Trap
Dam, May 4th 1905 (P449-48)

OHIO RIVER, Lock 1. Section of Lock Gate, 11 Aug 1911 (P449-51)

OHIO RIVER, Lock 1. Cylinder for Operating Lock Gate
Valves in Lower Gate, 4th Oct 1911 (P449-52)

(no title or date, sections of lock gates) (P449-53)
(do.) (P449-54)

typed text

from "World's Columbian Exposition, Chicago, Illinois 1893.
War Department Exhibit" pp. 42-46

National Archives RG77 File P449 55-70

blueprints

INNER END OF GIRDER	(P449-55)
INTERMEDIATE SECTIONS	(P449-56)
OUTER END OF GIRDER	(P449-57)
DOWNSTREAM END POSTS	(P449-58)
STUDS	(P449-59)
(P449-60 thru 65 have no titles. Misc. details)	
STRUTS & DIAGONALS	(P449-60)
TUG LEVER, SPRINGS	(P449-61)
SPRINGS, EYEBAR, AXLE	(P449-62)
WATER SEAL	(P449-63)
VALVE	(P449-64)
ROD, SCREW, GUIDE PINS	(P449-65)

above blueprints all file-date stamped 24 Oct 1911, apparently
related to lock gates and mechanisms

OHIO RIVER, LOCK AND DAM 1, PROPOSED COFFER DAMS NECESSARY FOR REPAIRING GATE TRACKS, 20 Feb 1917	(P449-66)
OHIO RIVER, DAVIS ISLAND DAM, Steel Rails for Gate Tracks, 5 May 1896 (0-3-23)	(P449-67)
OHIO RIVER, DAM No. 1, Lower Rail of Gate Tracks (1917?) (0-3-32)	(P449-68)
OHIO RIVER, DAVIS ISLAND, PROPOSED CHANGE OF BANK LINE, 28 July 1921	(P449-69)
OHIO RIVER, DAVIS ISLAND, REPAIR PLANT GENERAL PLAN, April 11, 1922 (0-5-26)	(P449-70)

National Archives RG77
Ohio River - Davis Island Dam 0-6-1 thru 44

drafting linen

OHIO RIVER, Details of Machinery for Operating Wickets, 28th Aug 1883	(0-6-1)
OHIO RIVER, Details of Plates for Upper and Lower Gate and Valve Machinery, 24 Jan 1884	(0-6-2)
21 Cast Iron Valve Shaft Boxes, 27 Oct 1884	(0-6-3)
OHIO RIVER, Valve Crank Attachment, 27 June 1894	(0-6-4)
OHIO RIVER, Davis Island Dam Accumulator to Control Steam Valve of Pump for Operating Hydraulic Jacks. Mar 6th 1899	(0-6-5)
lock discharging valve gear, 31 Mar 1902	(0-6-6)
(valve mechanisms, dated 1902-08)	(0-6-7 thru 12)
OHIO RIVER, DAVIS ISLAND DAM, lock gate chain, full size, 11 Apr 1891	(0-6-13)
(chain drum & shaft, 1897, 1898)	(0-6-21, 0-6-22)
OHIO RIVER, DAVIS ISLAND DAM, lock gate axle & Journal Box, Jan 30, 1899	(0-6-24)
OHIO RIVER, DAVIS ISLAND DAM, chain for lower lock gate, 17 June 1899	(0-6-25)
OHIO RIVER, DAVIS ISLAND DAM, chain drum for upper lock gates, 28 Dec 1899	(0-6-26)
(iron hardware, misc. drawings 1900-1908)	(0-6-27&28, -34 thru 36)
OHIO RIVER, DAVIS ISLAND DAM, Pillow Block & Housing for Lock Gate Chain Drum Shaft	(0-6-37)
(brace bars, upper gate engine, 26 Mar 1909	(0-6-39)
OHIO RIVER, DAVIS ISLAND DAM, Complete Set of Gears for Operating Lockgate, 3 Oct 1907	(0-6-41)
OHIO RIVER, Lock No. 1. Cylinder for Operating Lock Gate Valves, 4 Oct 1911	(0-6-44)
OHIO RIVER, Lock No. 1. Section of Lock Gate, 11 Aug 1911	(0-6-44)

National Archives RG77
Ohio River - Davis Island Dam, 0-7-2 thru 55

drafting linen

(misc.)	(0-7-2)
(dump car)	(0-7-3 & 4)
(coffer dam)	(0-7-5)
(misc. drawing)	(0-7-6)
Comparison between Pasqueau and the Chanoine Hurter	(0-7-7)
(conduit centers)	(0-7-8)
(causeway)	(0-7-9)
(concrete mixer, elevations)	(0-7-10)
(details of concrete mixer platform)	(0-7-11)
(measured drawing of 44 star national flag)	(0-7-12)
Powell's Curves, old bear trap curves	(0-7-13)
Pasqueau Navigable Pass Weirs	(0-7-14)
Yard Derrick, Davis Island Dam 1879	(0-7-15)
Riverwall of lock, 1880	(0-7-17)
OHIO RIVER, Pumps used for placing Puddling in Navigable Pass Cofferdam 1881 (2 sheets)	(0-7-18 & 19)
(Pasqueau? drawing) 13 Oct 1881	(0-7-20)
(pump?) 1883	(0-7-21)
Design of Hurter for Movable Dams, 15 Oct 1886	(0-7-22)
Davis Island Dam, Design of Hurter, Sept 21, 1890	(0-7-23)
(misc. machinery details, bank protection, ca. 1890-93)	(0-7-24 thru 33)
(smoke stack) 1911	(0-7-36)
(map of loss of US Launch Wenonah) 1911	(0-7-38)
(misc. blueprints of steel hardware)	(0-7-40)

National Archives RG77
Ohio River - Davis Island Dam 0-1-15 thru 0-4-15

drafting paper and blueprints

(misc. drawings) 1912	(0-1-15 thru 18 & 20)
(maneuvering boat for dam) 14 Feb 1890	(0-2-23)
Iron horse, 1888	(0-2-18)
(Section, Chanoine dam and gate foundation) 1886	(0-3-2)
(wickets, detail) 1879	(0-3-5)
OHIO RIVER, DAVIS ISLAND DAM, Upper Guide Wall, Open Drain and Drift Chute, 17 Dec 1900	(0-3-24)
OHIO RIVER, Lower Wall of Gate Recesses. 12 Oct 1878	(0-3-29)
OHIO RIVER, Details of Wicket Winch for Davis Island Dam, 28 Apr 1882	(0-4-15)

National Archives RG77
Ohio River Davis Island Dam 0-8-3 thru 0-8-12

drafting linen

(Rebuilding back channel dam, misc. drawings) 1903-07	(0-8-3)
	(0-8-4)
	(0-8-4A)
	(0-8-5)
	(0-8-6)
	(0-8-7)
	(0-8-9)
	(0-8-10)
	(0-8-11)
Plan and Section of Dam between Davis and Neville Islands, as constructed, 17 Sept 1906	(0-8-12)

National Archives RG77
Ohio River - Davis Island Dam 0-6-45 thru 0-6-50

drafting linen

(full size details of valve connections for lower
gate) 1886

(0-6-49)

(do.)

(0-6-50)

blueprints

(set of about 15 drawings of lockgates) 1911

(0-6-45)

(set of about 15 drawings of lockgates) 1912

(0-6-46)

(lock gate hardware, 2 sheets, ca. 1913)

(0-6-47 & 48)

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Ohio River - Davis Island Dam 0-2-1 thru 0-2-26

(maneuvering boat) 1894-95	(0-2-1, -3, -4, -5)
1907	(0-2-8)
1908	(0-2-9 & -10)
(steel trippery? hook)	(0-2-7)
(do.)	(0-2-11)
Details of Iron Work for Navigable Pass. 1881	(0-2-13)
(misc. drawings 1881)	(0-2-14 thru 16)
(misc. drawings 1901)	(0-2-17, 19 & 20)
(wickets, misc. drawings) 1905	(0-2-21 thru 23)
1902	(0-2-24)
1910	(0-2-25 & 26)

National Archives RG77
Ohio River - Davis Island Dam 0-1-1 thru -14

drafting linen

(house plans for lockkeepers house) Mar 16, 1891	(0-1-1)
(veranda addition to lockkeepers house) 1904	(0-1-2)
(do.)	(0-1-3)
(employees residence)	(0-1-4)
(details of woodwork in residence)	(0-1-6)
OHIO RIVER, DAVIS ISLAND DAM, Power House, 17 Feb 1899	(0-1-7)
OHIO RIVER, DAVIS ISLAND DAM, Extension of Piers at Davis Island Dam, 22 Aug 1885	(0-1-9)
(pier repair) 1901	(0-1-10)
OHIO RIVER, DAVIS ISLAND DAM, Abutment with Accessories, 1882	(0-1-11)
(proposal abstracts for building dam) 1903	(0-1-12)
OHIO RIVER, DAVIS ISLAND DAM, power house floor plan, 1912	(0-1-13)
abstract of bids: gas engines, air compressors & starting plant for Davis Island Dam, 1912	(0-1-14)

National Archives RG77
Ohio River - Davis Island Dam 0-4-1 thru 0-4-40

drafting linen

(various plans for Weirs No. 1 & 2, 1880 - 81)	(0-4-1 thru -13)
(wickets) 1882	(0-4-14)
(Weir No. 2) 1882	(0-4-16 thru -18)
(Weir No. 3) 1901	(0-4-19 thru -25)
(wicket for Weir No. 1) 1903	(0-4-26)
(Weir No. 3) 1906	(0-4-27)
(do.) 1907	(0-4-28)
(Bear trap) 1905	(0-4-29 thru -33)
(wicket winch details) 1882	(0-4-34)
(trestle winch) 1877	(0-4-35)
(wicket winch) 1877	(0-4-36)
Weir No. 3, Trestle, 1916	(0-4-37)
Weir No. 3, repair parts, 1916	(0-4-38)
(wickets of Lock & Dams No. 1-4 on Ohio River) 1917	(0-4-39 & 40)

National Archives RG77
Pittsburgh District Office Plans of Locks and Dams, Ohio River
Miscellaneous Drawings for Miscellaneous Locks

drafting linen

OHIO RIVER, Lock Gate for Lock at Davis Island Dam,
4 Mar 1878. Kinsey

OHIO RIVER, Plan and Sections of Machinery for Operating
Valves at Upper Gate Recess. 20 Nov 1878. Kinsey (No. 79)

OHIO RIVER, Details of Gate Tracks. 14 Oct 1879. Kinsey (No. 77)

OHIO RIVER, Downstream End of River Wall. 25 June 1879.
Kinsey (No. 80)

OHIO RIVER, Details of Machinery for Lower Lock Gate.
18 Jan 1883. Kinsey

National Archives RG77
Pittsburgh District Office Plans of Locks and Dams, Ohio River
Lock and Dam No. 1, Davis Island Dam, Chanoine Dam
0-3-1 thru 0-3-34

drafting linen

Chanoine Dam 22 July 1880	(0-3-1 thru -3)
Ohio River (Details of Arches for Wickets) 19 Aug 1878	(0-3-4)
(details: screens for valves in riverwall) Oct 7, 1880	(0-3-6)
(grillage for floor of lock) 7 Mar 1881	(0-3-7)
(Chanoine plan and elevation) 1882	(0-3-8)
River wall as constructed, 17 Jan 1883	(0-3-9)
Ohio River, General Plan of Pipes at Davis Island Dam, 1884	(0-3-11)
(misc. drawings of foundations and walls) 1885	(0-3-12 thru -14)
(do.) 1886	(0-3-15 thru -20)
(do.) 1891	(0-3-21 & -22)
(steel rails for gate tracks) 1896	(0-3-23)
(upper guide wall) 17 Dec 1900	(0-3-25)
(river wall valve shaft arm) 1909	(0-3-27)
(air shafts in culverts, Kinsey) 1878	(0-3-28)
(lower guide wall and drift chute) 1900	(0-3-30)
(lower rail gate tracks) 1917	(0-3-32)
(proposed cofferdams) 1917	(0-3-33)
(plates for river wall) 1884	(0-3-34)

DOCUMENTS RELATING TO LOCK NO. 1 - DAVIS
ISLAND DAM, OHIO RIVER, ALLEGHENY CO., PA

Contained in:

Engineering Division Files
Pittsburgh District
U.S. Army Corps of Engineers
William S. Moorhead Federal
Building
Pittsburgh, PA 15222

Compiled by:

Conrad Weiser
Pittsburgh District
U.S. Army Corps of Engineers
William S. Moorhead Federal Bldg.
Pittsburgh, PA 15222

October 1982

OHIO RIVER: Head of Davis Island, SHOWING SITE SELECTED FOR MOVABLE DAM NO. 1, Examination made May 18-22, 1875 Scale: 1 inch = 100 feet. File No. 0-5-6

Plan of the upper portion of Davis Island, Allegheny County, Pennsylvania. Survey made by James H. Reno, County Engineer. Oct. 1877. Scale 1 inch to 50 feet. File No. 0-5-7

Location of Dam No. 1 Closing Chute. Davis Island Side, South Bank. Scale 1" = 100'. 1877 File No. 0-5-9 (BP)

Davis Island (survey) Scale 1" = 100 ft., US Engineer Office, Davis Island Dam, Oct. 1878. Traced Oct. 14 1902 File No. 0-5-8

DAM 1 OHIO RIVER, Received with letter of W.R. Lowe dated Jan 17, 1880, 1" = 30' (shows land wall, old coffer dam, cribs and coffer dam extension.) File No. 0-7-16

(Construction drawing showing bore locations & depths, land wall, river wall, and coffer dam) no title or date, "Scale of 30" File No. 0-7-57

Ohio River, Plan and Elevation of Chanoine Dam for navigable pass at Davis Island. 3/4 inch Scale, 1st April, 1881, Kinsey. File No. 0-2-12

CHITTENDEN DRUM WEIR, CROSS SECTION and PLAN (Scale 1" = 20', no date) File No. 0-8-1 (BP)

Plat showing adjustment of Division Line between the Right of Way of the Pittsburgh Fort Wayne & Chicago Ry., and Land of the United States of America at Davis Island Dam, Allegheny County, Penn'a. May 1891. Scale 1 inch = 50 feet. File No. 0-5-10

Tract of Land purchased by U.S. from Mulvehill. (no date or scale) File No. 0-5-4

Tract of Land to be returned by U.S. to Mulvehill. (no date or scale) No File No.

James Sterrett's Line (property map, no date or scale) File No. 0-5-3

MOVABLE DAM NO. 1, Scales: General Plan 30 ft. = 1 inch, Section of Sewer 4 ft. = 1 inch (no date, but is prior to construction, ca. 1880-85. Plan shows railroad right-of-way, building locations, land wall and land wall coffer dam locations.) File No. 0-7-56

Note: All documents are on drafting linen paper unless marked (BP) for blue print only.

Railway Compromise Line (for water tanks at Davis Island Dam) December 26th 1891, Scale 1" = 6 feet. File No. 0-5-11 (drafting paper)

Map showing the U.S. property on the northside of the river, at Davis Island Dam. Scale 1" = 40 ft. (no date) File No. 0-5-5 (BP)

DAVIS ISLAND (shows upstream end of Island, Government property lines, WEIR No. 3, no date or scale) File No. 0-7-1

PLAN SHOWING RIGHT OF WAY THROUGH JACKMAN FARM, BELLEVUE, SCALE: 100 ft. to 1 in. (no date, 1897?, railroad right of way, 2 copies) File No. 0-5-16

OHIO RIVER, DAVIS ISLAND DAM, Park Improvement rear of Upper Guide Wall, Scale 1" = 30', Dated Dec. 6th 1900 File No. 0-7-34

OHIO RIVER Back Channel, Plan of Lots Situated in Neville, Stowe, Robinson Townships and Coraopolis Borough, Allegheny County, Pa., December 1901, Scale 1 inch = 300 feet. File No. 0-5-19

Plan of land acquired for construction of Lock at Davis Island Dam, Traced Oct. 8th 1902. Scale 1" = 50'. File No. 0-5-12

(Davis Island and vicinity ca. 1902 showing proposed filling of back channel?) File No. 0-5-20 (BP)

OHIO RIVER, LOCK NO. 1, Sketch Showing U.S. Reservation, Scale 1" = 100 ft., April 8, 1905. File No. 0-5-13

OHIO RIVER, DAVIS ISLAND DAM, Retaining Wall from Center of Lock to Lower Gate Recess, also Decking for Lower Gate Recess. Scales 3/16" & 1" = 1', August 29th 1905 File No. 0-3-26

OHIO RIVER, DAVIS ISLAND DAM, Plan showing Property owned by U.S. Government, Scale _____ 120' = 1 inch, March 30th 1907 File No. 0-5-14

PENN'A LINES WEST OF PITTSBURGH, P.F.W. & C.R.W. EASTERN DIV. WEST BELLEVUE, PA, PROPOSED OVERHEAD CROSSING Scale 1" = 50', May 10, 1910. Sheets 1, 2 & 3 of 3. File No. 0-7-45 (BP)

OHIO RIVER, PITTSBURGH ENGINEER DISTRICT, U.S. PROPERTY, DAMS 1 to 10 INC., In 1 sheet, Scale as shown (1" = 300' for DAVIS ISLAND DAM). Mar. 9, 1918. File No. 0-5-15

PITTSBURGH DISTRICT, REPAIR PLANT AND DRY-DOCK, In 4 sheets, Sheet 1, Scale 1" = 120', Jan. 31, 1920. File No. 0-5-17

OHIO RIVER, DAVIS ISLAND DAM, BELLEVUE, PA in 1 Sheet, Scale 1" = 50', Sept. 19, 1921. File No. 0-5-18

OHIO RIVER, DAVIS ISLAND REPAIR STATION, GENERAL PLAN, In 1 sheet,
Scale 1" = 50', Feb. 1922. File No. 0-5-20

OHIO RIVER, DAVIS ISLAND REPAIR STATION LAND WALL, In 1 Sheet, Scales as
Shown (1/16" = 1'-0", 1/8" = 1'-0", 1" = 1'-0"). Feb. 14, 1922.
File No. 0-5-21

OHIO RIVER, DAVIS ISLAND REPAIR PLANT, GENERAL PLAN, In 1 Sheet, Scales as
shown. (PLAN Scale 1" = 50'-0") April 11, 1922 File No. 0-5-26

OHIO RIVER, DAVIS ISLAND DAM, BELLEVUE, PA. In 1 Sheet, Scale 1" = 200',
Mar. 27, 1923. File No. 0-5-27

OHIO RIVER, EMSWORTH POOL, LOCK SITE OF OLD DAM NO. 1 (DAVIS ISLAND),
BELLEVUE AND AVALON BOROUGHES, ALLY. CO., PA. Scale 1" = 100', May 19, 1938

OHIO RIVER, DAVIS ISLAND DRY DOCK, PLAN AND SECTIONS, In 1 Sheet, Scales as
shown (1/16" = 1', 1/8" = 1') (no date) File No. 0-5-19

GENERAL LAYOUT OF REPAIR PLANT ON DAVIS ISLAND ("VOID See-0-5-17 Sheet 1 of
4", no date)

OHIO RIVER LOCKS & DAMS. (Comparative data tables in 2 sheets for locks &
dams no's 1-29, and 37. No date but post-1907) File No. 0-7-37 (BP)

OHIO RIVER LOCKS & DAMS (Comparative data table for locks & dams no's 1-41,
42-54 no date) File No. 0-7-49 (2 copies) (BP)

OHIO RIVER LOCKS & DAMS (Comparative data table for locks & dams no's
1-54), PROPOSED OF LOCKS AND DAMS 41 to 48 (data listed only for 43-48) (no
date). File No. 0-7-43 (BP)

APPENDIX B

Graphic Documentation: Lock No. 1 - Davis Island Dam,
Ohio River, Allegheny County, Pennsylvania

